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Abstract

The invention provides for a delivery system where a viscous material such as dental composite is heated by an induction field or by resistance to an electric current. The system comprises at the proximal end a capsule-like cartridge that is self heating. The capsule may be fabricated of any number of heat conducting polymers or doped polymers that are susceptible to induction fields or any material that will heat when an induction current is applied. In the second instance the capsules may have a resistance wire of the appropriate metal or any other material to allow heating of the capsule when a current is applied. In the third instance the capsule may have an induction coil embedded in it's wall combined with any type of metal or other material where this becomes the heating device when current of the appropriate nature is applied. In the fourth instance a thin film or foil may be applied to either the outer surface or the inner surface of the capsule such that when a current is applied the foil or film heats and in so doing heats the capsule and the contents.

Coupled with the above described capsule is a delivery device. This hand held device, whether powered manually or electrically forces a shaft to engage a piston embedded within the cartridge to move forward, dispensing the material within the cartridge at it's proximal end. In the manually powered mode, an electrical power source, whether a battery, capacitor discharge or AC/DC current, is used exclusively to activate the various heating methods described above. In the electrically powered mode, a linear stepper motor or other such motor with a proper configuration allows the shaft to engage the piston embedded in the cartridge and allow the material contained within the cartridge to be dispensed at it's proximal end. In the electrically powered configuration the power source described above is used to power the motor as well as the energy to activate the various heating elements described above. In addition where the force needed to extrude the material contained in the capsule, embedded in the device, whether manually or electrically applied to the device, such device may have the induction coil embedded in the barrel extension of the device in such placement as to provide adequate heating of the capsule.